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Utilization and Challenges of Integrative Teaching Strategies in Mathematics for Junior High School Students of Holy Trinity College of General Santos City

Kristel Mae Patol^{1*}

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ABSTRACT

This study examines the utilization and challenges of integrative teaching strategies (ITS) among Mathematics teachers at Holy Trinity College of General Santos City, focusing on thematic teaching, content-based instruction, and focused inquiry. ITS promotes interdisciplinary learning, critical thinking, and student engagement by integrating various subjects and real-world applications. Despite their benefits, their implementation in Mathematics education remains underexplored. Findings indicate that Mathematics teachers frequently employ ITS, with thematic teaching fostering collaboration, content-based instruction utilizing diverse resources, and focused inquiry enhancing critical thinking. However, challenges such as insufficient professional development, time constraints, and difficulties aligning curriculum standards with interdisciplinary approaches persist. A weak negative correlation was found between ITS utilization and these challenges, suggesting that increased ITS use slightly mitigates difficulties but is not the primary determinant of challenges faced. The study recommends continuous professional development, improved resource allocation, and structured collaboration time to enhance ITS integration. Further research should explore ITS effects on student outcomes, including academic achievement and critical thinking, as well as the role of technology in supporting interdisciplinary learning and overcoming logistical barriers.

INTRODUCTION

Integrative teaching strategies (ITS) combined diverse educational approaches to create holistic learning experiences, fostering deeper understanding and critical thinking. This study focused on thematic teaching, content-based instruction, and focused inquiry. Recent years emphasized analyzing student mathematical performance, particularly for those with learning difficulties, to develop tailored instruction (Blanco & Lopez, 2021). Teachers increasingly needed to select and design approaches for diverse learners. At Holy Trinity College of General Santos City, the Junior High School Department used interdisciplinary performance tasks aligned with ITS, integrating math with other subjects under common themes and using integrated assessment matrices (Dalidig, 2012). This connected learning to real-world contexts, enhancing engagement. Conducted during the 2023-2024 academic year, the study analyzed ITS implementation, impact on student engagement, and teacher perceptions in Junior High School Mathematics. Focusing on three ITS approaches, it acknowledged limitations regarding external factors. While providing insights into ITS application in mathematics, findings might not be generalizable. The study aimed to inform strategies for improving interdisciplinary math instruction and sustaining student engagement.

Research Objectives

Despite the implementation of ITS in Mathematics, research on their utilization remains limited. This study aimed to determine the extent of ITS utilization and

the challenges Mathematics teachers face in Junior High School. Specifically, it sought to answer the following research questions:

1. What is the extent of utilization of integrative teaching strategies by Mathematics teachers in Junior High School in terms of:
 - 1.1 Thematic Teaching?
 - 1.2 Content-Based Instruction?
 - 1.3 Focused Inquiry?
2. What is the extent of challenges experienced by Mathematics teachers in using integrative teaching strategies in terms of:
 - 2.1 Thematic Teaching?
 - 2.2 Content-Based Instruction?
 - 2.3 Focused Inquiry?
3. Is there a significant relationship between the extent of ITS utilization and the challenges experienced by Mathematics teachers in Junior High School?
4. What specific challenges do teachers encounter in applying integrative teaching strategies?

LITERATURE REVIEW

Integrative Teaching Strategies (ITS)

Integrative teaching strategies, particularly in mathematics, aim to connect learning to real-world applications and foster deeper understanding. Asares (2010) describes a three-level integration within Bloom's taxonomy, progressing from factual recall to conceptual understanding and application, incorporating all learning domains. This interdisciplinary approach focuses on a single theme, integrating subjects like math, English, and

¹ Holy Trinity College of General Santos City, Philippines

* Corresponding author's e-mail: kristelmaepatol@gmail.com

science to allow students to explore topics from multiple perspectives (Bruner, 1996). Horntvedt *et al.* (2018) highlight interactive and clinically integrated strategies, emphasizing the need for educators' awareness and skill in these methods. Ringgold (2018) discusses the NCTM's guidance on teaching math through the Common Core State Standards, emphasizing curriculum, equity, and the integration of technology. Aliazaz and Reyes (2021) found that online integrative strategies, like focusing inquiry and thematic teaching, improved students' interpreting data skills and overall performance. Ediger (2011) stresses the importance of mathematical reasoning and the use of models, while the Common Core curriculum aims to ensure understanding of key mathematical concepts, emphasizing abstract and quantitative reasoning. Ultimately, mathematics teachers play a crucial role in helping students achieve Common Core standards by building a strong foundation of mathematical knowledge and teaching practices. Integrative teaching strategies, when combined with appropriate instructional methods, have shown significant potential in enhancing students' learning outcomes in Mathematics. According to a study conducted by Nurideen *et al.* (2024), the incorporation of learner-centered teaching strategies such as guided discovery, brainstorming, role-playing, mathematical games, and group work significantly influences students' conceptual understanding of mathematical concepts, particularly in learning circle theorems.

Thematic Teaching

Thematic teaching, an approach that integrates various subjects around a central theme, offers numerous benefits for student learning and engagement. Research suggests it fosters a more holistic understanding by connecting seemingly disparate disciplines (Daligdig, 2012; Desyandri *et al.*, 2019), contextualizing abstract concepts within a relevant framework (Cherni, 2020), and ultimately improving critical thinking and information retention (Drake & Reid, 2018). Ashokan (2014) highlights its alignment with children's natural learning processes, while studies by Aliazaz and Reyes (2021) and Fitriana *et al.* (2020) demonstrate its effectiveness in enhancing science skills and critical thinking abilities, respectively. However, successful implementation of thematic teaching requires careful and deliberate planning (Cherni, 2020). Effective professional development is crucial (Darling-Hammond *et al.*, 2017; Drake & Reid, 2020), emphasizing practical strategies for integration, collaborative planning among teachers, and ongoing support. While the benefits are substantial, challenges such as time constraints and the potential for varying effectiveness across different skill domains have been noted in the literature (Boyle & Bragg, 2008; Abuga, 2017). Thematic teaching aligns strongly with constructivist learning theories, drawing on the work of Piaget, Vygotsky, and Bruner, and greatly benefits from interdisciplinary collaboration among educators. As Darling-Hammond *et al.* (2017) suggest, effective professional development—characterized by a focused

content approach, active learning strategies for teachers, and sustained support—is essential for successful and sustained implementation of thematic teaching (Drake, 2010).

Content-Based Instruction (CBI)

In integrating content learning with language development, has been explored as a method to enhance student understanding and engagement. Blanco and Lopez (2021) define CBI as the simultaneous study of language and other subjects, with content dictating language presentation, aiming to improve academic language and subject-specific skills. This approach connects learning to real-life situations, increasing student motivation (Bruner, 1996). While CBI can be engaging and promote deeper learning, challenges exist. Some students may feel their language development is insufficient, and overuse of the native language can hinder target language acquisition (Saifurahman, 2014). Finding appropriate materials and effectively conveying information in the target language can also be difficult, particularly in multilingual classrooms (Saifurahman, 2014; Gall, 2007). Saifurahman (2014) detailed the implementation of CBI in mathematics teaching, noting challenges in the main activity phase and issues faced by both teachers and students, such as lack of vocabulary, apprehension in speaking, and difficulty understanding instructions. Alamri (2020) categorized lesson study, a form of classroom inquiry for teacher development, under CBI. Otto (2015) found that while content-based videos alone had limited impact on math ability, incorporating think-aloud lesson plans improved learning. Sibulkin (2018) highlighted the need for longitudinal studies on CBI's long-term effects on academic achievement. Furthermore, difficulties in integrating diverse content and fostering teacher collaboration (Nation & Newton, 2009) underscore the need for professional learning focused on collaborative expertise, content integration, and effective assessment practices aligned with CBI principles.

Focused Inquiry

This is an interdisciplinary approach that uses questions to organize learning, has gained prominence in mathematics education. Gholam (2019) emphasizes its interdisciplinary nature, where learners become creators of knowledge, guided by inquiry rather than content. Aquino (2009) notes the cyclical nature of inquiry learning, with new questions arising from data analysis, and highlights the use of inquiry-based teaching techniques at all education levels. Llewellyn (2005) provides a case study approach for teaching science through inquiry, focusing on national standards and developing students' scientific thinking and inquiry skills. Johnson and Lee (2023) found that inquiry-based instruction significantly improved students' critical thinking and problem-solving skills in mathematics. Similarly, Khasawneh *et al.* (2023) reported that inquiry-based teaching led to greater gains in mathematical proficiency, confidence, and student engagement. White-

Clark *et al.* (2008) advocate for constructivist “guide on the side” teaching, emphasizing hands-on activities, discovery learning, and differentiated instruction to improve secondary mathematics achievement. The importance of professional development in supporting inquiry-based teaching is highlighted by Khasawneh *et al.* (2023), who found that high-quality programs increased teachers’ likelihood of integrating inquiry effectively. Martinez and Perez (2023) further demonstrated that targeted professional development increased teachers’ confidence and competence in using inquiry-based strategies. However, challenges remain, including the complexities of differentiated instruction within inquiry-based environments (Darling-Hammond *et al.*, 2017) and the need for strong content knowledge (Darling-Hammond *et al.*, 2017). These findings underscore the need for ongoing professional development, improved resource accessibility, and structured collaboration to support teachers in effectively implementing inquiry-based teaching strategies (Fogarty, 2017).

MATERIALS AND METHODS

Research Design

This study utilized a mixed-methods approach, combining descriptive and correlational quantitative research with qualitative data collection. The quantitative component aimed to determine the extent of integrative teaching strategies (ITS) utilization and the challenges faced by junior high school mathematics teachers. The correlational aspect explored the relationship between these two variables.

Evaluators

The qualitative component, through focus group discussions and interviews, provided richer insights and context to the quantitative findings. This mixed-methods design allowed for a more comprehensive understanding of the research problem. While the description doesn’t explicitly mention external evaluators, the study underwent ethical review by the Mindanao State University – General Santos Institutional Ethics Review Committee (MSU-General Santos IERC). This committee served as an independent body to evaluate the research proposal and ensure ethical standards were met before data collection commenced. The researchers themselves analyzed the collected data.

Respondents of the Study

The quantitative phase of the study included the entire population of junior high school mathematics teachers at Holy Trinity College of General Santos City. For the qualitative phase, five out of the seven junior high school mathematics teachers voluntarily participated in a focus group discussion. This purposeful sampling in the qualitative phase allowed for in-depth exploration of teachers’ experiences and perspectives.

Data Collection

The data collection was conducted in two phases. Quantitative data was gathered using a validated questionnaire consisting of two parts. The first part assessed the level of ITS utilization, while the second part explored the challenges encountered by teachers. Responses were measured using a five-point Likert scale. Qualitative data was collected through in-depth interviews with the same teachers who participated in the focus group discussion. The researcher personally administered the survey after obtaining approval from the school administration, ensuring a standardized data collection process. Interviews were transcribed to facilitate analysis.

Data Analysis

Quantitative data were analyzed using descriptive statistics, specifically the weighted mean, to determine the average levels of ITS utilization and perceived challenges. Pearson’s correlation coefficient was used to explore the relationship between ITS utilization and the challenges faced. The Shapiro-Wilk test was conducted to check for normality of data distribution. Inferential statistical analysis was conducted at a 0.05 significance level. Qualitative data from the interviews were analyzed thematically to identify recurring patterns and key themes related to teachers’ experiences with ITS and the challenges they encountered.

Ethical Considerations

Ethical considerations were prioritized throughout the study. Ethical clearance was obtained from the Mindanao State University – General Santos Institutional Ethics Review Committee (MSU-General Santos IERC) before any data collection began. The study adhered to the Data Privacy Act of 2012, ensuring the confidentiality and security of participant data. The anonymity of respondents was maintained throughout the study. Participants were informed of their right to participate or withdraw from the study at any time without consequence. Informed consent was obtained from all participants before their involvement in the study. The research was conducted in a manner that minimized disruption to regular school activities. The researchers also committed to submitting a final/closure report and any protocol amendments to the MSU-General Santos IERC, demonstrating accountability and transparency.

RESULTS AND DISCUSSIONS

The study presented the results and discussions regarding the utilization and challenges of integrative teaching strategies in mathematics for junior high school students. The organization of the results presentations was aligned with the order and sequence of the study’s specific problem. Results were presented in succeeding tables with corresponding discussions.

Table 1: Descriptive Analysis of the Extent of Utilization of the ITS

Indicator	Mean	RANK
Thematic teaching		
I incorporate thematic teaching in my class within a school year.	3.75	High
I am confident in my ability to design and implement thematic teaching in the curriculum.	4.25	Very High
I brainstormed the “essential questions and understanding” to facilitate the study toward the essential understanding.	4.38	Very High
I collaborate with other teachers to create interdisciplinary thematic teaching.	4.50	Very High
I receive professional development or training for thematic teaching strategies.	4.13	High
COMPOSITE MEAN	4.20	High
Content-Based Instruction		
I connect the learning content to real-world skills.	4.25	High
I contextualized learning wherein I can present information where the learners construct ideas based on their experiences.	3.86	High
I use the subject’s jargon, culture, and methods that employ math skills.	4.00	High
I use objects, pictures, audio-visual presentations, and proposals supporting translation, explanation, and definition aids to understand the subject matter.	4.63	Very High
I receive professional development or training for the content-based instruction strategy.	4.13	High
COMPOSITE MEAN	4.18	High
Focused Inquiry.		
I connect the learning content to real-world skills.	4.25	High
I contextualized learning wherein I can present information where the learners construct ideas based on their experiences.	3.86	High
I use the subject’s jargon, culture, and methods that employ math skills.	4.00	High
I use objects, pictures, audio-visual presentations, and proposals supporting translation, explanation, and definition aids to understand the subject matter.	4.63	Very High
I receive professional development or training for the content-based instruction strategy.	4.13	High
COMPOSITE MEAN	4.18	High

Legend: 4.50 – 5.00 - Very High 3.50 - 4.49. - High; 2.50 - 3.49 - Moderately High; 1.50 - 2.49 - Low; 1.00 - 1.80 - Very Low

Table 1 revealed varying degrees of Integrative Teaching Strategies (ITS) utilization across different mathematics education approaches. Regarding thematic teaching, the high overall mean score of 4.20 aligns with Drake’s (2010) assertion that thematic approaches effectively foster interdisciplinary connections. The study’s finding of robust teacher collaboration in creating interdisciplinary units (M=4.50) supports Drake and Reid (2020) emphasis on collaborative planning as crucial for successful integrated curriculum design. However, the challenge of consistent implementation throughout the school year (M=3.75) highlights the need for sustained support, such as increased planning time and targeted professional development, mirroring concerns raised by previous research on the complexities of long-term thematic implementation. In Content-Based Instruction (CBI), the study’s high mean score of 4.18 reflects a strong adoption rate. The extensive use of instructional aids (M=4.63) suggests a focus on clarifying concepts, consistent with CBI principles. While connecting content to real-world applications (M=4.25) and integrating subject-specific language (M=4.00) also demonstrate effective implementation, the need for improvement in contextualizing learning (M=3.86) aligns with research

highlighting the importance of authentic contexts in CBI (Nation & Newton, 2009). For focused inquiry, the high mean score of 4.25 underscores its effectiveness in promoting higher-order thinking skills (M=4.63) and developing realistic problem-solving activities (M=4.38). The strong professional development component (M=4.38) reflects a commitment to supporting teachers in this approach. However, the challenges in consistently implementing differentiated instruction (M=3.63) echo previous research highlighting the complexities of tailoring instruction to individual student needs within inquiry-based learning environments (Darling-Hammond *et al.*, 2017). Overall, the findings across all three approaches reinforce the need for ongoing professional development to support teachers in effectively implementing ITS, as emphasized by Fogarty (2017). Mathematics teachers need continuous professional development to enhance their ability to implement integrative teaching strategies effectively. Additionally, the study emphasized that a variety of teaching approaches and instructional resources can improve students’ learning experiences when applied appropriately with discovery-based learning. This supports the current study as it reinforces the effectiveness of integrative teaching strategies (ITS)

Table 2: Descriptive Analysis: Extent of Challenges Experienced by Using ITS

Indicator	Mean	RANK
Thematic teaching		
Integrating multiple subjects within thematic teaching is challenging.	3.75	High
Finding appropriate resources and materials for integrative teaching in thematic teaching is difficult.	3.13	Very High
Assessing student learning effectively within integrative thematic teaching is problematic.	2.63	Moderately High
Collaborating with other teachers from different subjects to create integrated thematic lessons poses challenges.	3.13	Moderately High
The lack of professional development and training in integrative teaching strategies for thematic instruction is a significant challenge.	4.13	High
COMPOSITE MEAN	3.35	Moderately High
Content-Based Instruction		
Integrating content from different subjects into content-based instruction is challenging.	3.38	Moderately High
Adapting teaching materials and resources to support content-based instruction poses difficulties.	3	Moderately High
Collaboration with colleagues from different subject areas to develop integrated content-based instruction is challenging.	3.25	Moderately High
Assessing student learning effectively within content-based instruction presents challenges.	3	Moderately High
Limited professional development and training in integrative teaching strategies for content-based instruction is a significant challenge.	4.25	Very High
COMPOSITE MEAN	3.38	Moderately High
Focused Inquiry		
I model effective questioning techniques and guide the students to find the answers they need while engaging in the relevant curriculum areas.	3.88	High
I formulate essential questions that are wide enough for everyone to answer from their own perspective.	3.88	High
I sometimes had a difficult time understanding the concept of the lesson which led to being unable to engage the students at a deeper level.	2.25	Low
I capture evidence of learning and higher-order thinking as the students develop these skills.	3.88	High
I use a checklist, a learning continuum, or rubrics to guide students through their learning to keep them on task.	4.00	High
COMPOSITE MEAN	3.58	High

Legend: 4.50 – 5.00 - Very High 3.50 - 4.49. - High; 2.50 - 3.49 - Moderately High; 1.50 - 2.49 - Low; 1.00 - 1.80 - Very Low

in promoting student engagement, critical thinking, and conceptual understanding in Mathematics (Nurideen *et al.*, 2024).

Table 2 portrayed significant challenges faced by mathematics teachers in implementing Integrative Teaching Strategies (ITS). For thematic teaching, the moderately high composite mean score of 3.35 reflects obstacles in several areas. The most prominent challenge is the lack of professional development and training (M=4.13), a finding that resonates with research emphasizing the crucial role of ongoing support in effective thematic implementation (Drake, 2010). Difficulties in integrating multiple subjects (M=3.75) and finding suitable resources (M=3.13) further underscore

the need for targeted resources and collaborative planning time, as highlighted by previous studies on integrated curriculum development. In Content-Based Instruction (CBI), the moderately high composite mean of 3.38 points to similar challenges. The urgent need for professional development (M=4.25) mirrors the findings in thematic teaching, suggesting a broader need for pedagogical support across ITS approaches. Difficulties in integrating diverse subject content (M=3.38) and fostering collaboration among teachers (M=3.25) align with research emphasizing the importance of collaborative expertise and content integration in CBI (Nation & Newton, 2009). The challenge in effective assessment practices (M=3.00) also indicates a need for

professional learning focused on aligning assessment with CBI principles. For focused inquiry, while the composite mean of 3.58 suggests relatively fewer challenges compared to the other approaches, critical areas still require attention. While teachers demonstrate strengths in using structured tools (M=4.00), effective questioning (M=3.88), and assessing higher-order thinking (M=3.88), the significant challenge in teachers' full understanding of lesson concepts (M=2.25) highlights a critical need for

enhanced content knowledge and targeted professional development. This finding reinforces the importance of strong content knowledge as a foundation for effective inquiry-based teaching, as emphasized by Darling-Hammond *et al.* (2017). Addressing these challenges through robust professional development, improved resource accessibility, and structured collaboration can significantly enhance ITS effectiveness in mathematics education.

Table 3: Inferential Analysis: Relationship between the Level of Utilization and the Extent of Challenges of Mathematics Teachers Using Integrative Teaching Strategies

Variables Correlated	r	Extent of Relationship
Level of utilization and extent of challenges of Mathematics teachers using integrated teaching strategies.	-0.17	VERY WEAK

[p-value of 0.71 at a 0.05 level of significance]

Table 3 presents the inferential analysis examining the relationship between the level of Integrative Teaching Strategy (ITS) utilization and the extent of challenges experienced by mathematics teachers. The analysis revealed a very weak negative correlation (-0.17) between these two variables. While this negative correlation suggests a slight tendency for higher ITS utilization to be associated with fewer challenges, this relationship is not statistically significant ($p = 0.71$). This lack of statistical significance indicates that the observed correlation is likely due to chance and that other factors, not measured in this study, play a more substantial role in the challenges teachers face when implementing ITS.

This finding reinforces existing research highlighting the complex and multifaceted nature of factors influencing teacher effectiveness. As Darling-Hammond *et al.* (2017) point out, school resources, administrative support, and access to high-quality professional development are likely to be more influential. Furthermore, the small amount of variance explained (3%) further emphasizes that ITS utilization alone does not adequately explain the challenges teachers encounter. Future research should explore these other contributing factors to develop more effective interventions and support systems for teachers implementing integrative teaching strategies.

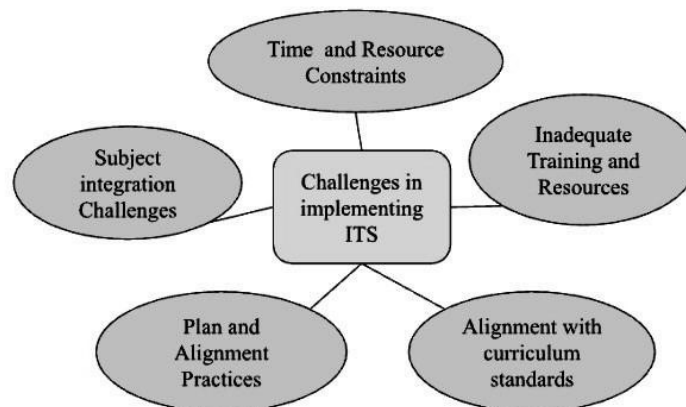


Figure 1: Thematic Analysis Map of the Challenges Encountered by the Teachers in Applying the ITS.

This study explores the challenges encountered in implementing Integrative Teaching Strategies (ITS) in junior high school mathematics education through a thematic map, providing a visual representation of the obstacles faced by teachers. Employing Braun and Clarke's (2006) thematic analysis framework, the researcher rigorously analyzed qualitative data collected from focus group discussions (FGDs) with mathematics teachers. This systematic approach facilitated the identification and interpretation of key themes and patterns within the data,

yielding rich insights into the complexities of integrating ITS into classroom practice. The resulting thematic map visually represents the prominent challenges reported by teachers. These included constraints related to time and resources (e.g., limited planning time, insufficient access to materials), inadequate professional development and support for implementing ITS, difficulties aligning ITS with existing curriculum standards, challenges in adapting assessment practices to reflect the integrated nature of the approach, and the complexities of effectively integrating

multiple subjects within a cohesive thematic unit. Each thematic category was thoroughly investigated to explore commonalities, variations, and interrelationships, providing a comprehensive understanding of the multifaceted challenges teachers experience. This in-

depth analysis serves as a foundation for developing targeted recommendations to effectively address these challenges and support successful ITS implementation in mathematics education.

Table 4: Excerpt on the Challenges Encountered by the Teachers in Applying the ITS.

Code Names	Significant Statement	Formulated Meaning	Theme Cluster
L2 - T1	“Time allotted for a segment of lessons; Time management and difficulties in designing activities/material; Incongruence between subject’s standards for the same grading period.”	Time constraints and management issues including difficulties in designing activities/material and incongruence between subject standards.	Time Constraints and Management
L4 - T3	“As a math teacher, I think the most challenging part of incorporating integrative teaching strategies into my class is the limited preparation time, limited implementation time, and limitations in terms of resources...”	The challenges faced by math teachers in integrating teaching strategies include limited preparation and implementation time, and lack of resources.	Time Constraints and Management, Inadequate Training and Resources
L14 - T1	“Incorporating and aligning the thematic and integrated curriculum in the lesson/performance task. Introducing interdisciplinary projects or performance tasks.”	Strategies for aligning integrative teaching with standardized testing and curriculum requirements, including incorporating thematic and integrated curriculum and introducing interdisciplinary projects.	Alignment with Curriculum Standards, Plan and Align Assessment Practices
L18 - T5	“To address challenges of aligning integrative teaching with standardized approaches, I seek to identify common learning objectives among the curriculum...”	Strategy of identifying common learning objectives among the curriculum to address challenges in aligning integrative teaching with standardized approaches.	Alignment with Curriculum Standards, Plan and Align Assessment Practices
L22 - T3	“For me, it's actually easier to connect math with other subjects since math is fundamental and is present in other fields as well...”	Ease of connecting math with other subjects due to its fundamental nature, but difficulty arises in creating performance tasks related to math and other fields.	Subject Integration Challenges

Table 4 revealed that mathematics teachers face substantial challenges in implementing integrative teaching strategies (ITS). Time constraints and management were primary obstacles, with teachers struggling to find preparation time and design curriculum-aligned integrated activities, consistent with findings by Darling-Hammond *et al.* (2017). Inadequate training and resources compounded these issues, limiting teachers’ capacity to effectively integrate subjects. Furthermore, curriculum and assessment alignment posed a significant challenge, as teachers grappled with balancing thematic curricula and standardized testing requirements, a difficulty supported by Drake (2010). While linking mathematical concepts across disciplines was relatively easy, designing meaningful interdisciplinary performance tasks proved difficult, indicating a need for targeted professional development in authentic assessment design. These findings emphasize the necessity for structured planning time, robust professional development, strategic resource investment,

and collaborative structures. Similarly, Mulega *et al.* (2023), in a study on linear programming, found that student success is significantly influenced by teaching strategies, and hindered by factors like limited resources, teacher incompetence, poor pedagogical approaches, negative student attitudes, and subpar textbooks, reinforcing the importance of effective teaching strategies and adequate resources in mathematics education.

CONCLUSION

This study investigated mathematics teachers’ use of Integrative Teaching Strategies (ITS), the challenges they encountered, and the relationship between these two factors. Teachers demonstrated strong ITS implementation, particularly in collaboration and instructional support, but needed improvement in consistently applying thematic teaching and contextualizing content-based instruction. Key challenges included difficulties integrating multiple subjects and accessing resources for thematic teaching,

aligning diverse content and developing effective assessments for content-based instruction, and gaps in teachers' conceptual understanding for focused inquiry. A significant barrier across all approaches was the lack of professional development. Time constraints and challenges aligning integrated lessons with curriculum standards and assessments also hindered effective implementation. Interestingly, the relationship between ITS utilization and the challenges teachers faced was weak and statistically insignificant. This crucial finding suggests that simply increasing ITS use does not necessarily alleviate the challenges teachers experience. Instead, the study concluded that addressing broader institutional factors, such as administrative support, resource accessibility, and, most importantly, structured and ongoing professional development, is essential for improving the effectiveness of ITS in mathematics education. Therefore, schools should prioritize capacity-building initiatives, ensure sufficient instructional resources are available, and foster collaborative planning among educators to facilitate more effective ITS implementation and promote interdisciplinary learning, critical thinking, and problem-solving skills in students.

Recommendation

To effectively enhance the implementation of Integrative Teaching Strategies (ITS), a multi-pronged approach involving administrators, teachers, and researchers is essential. School administrators should prioritize ongoing, sustained professional development specifically focused on key aspects of ITS, including effective subject integration techniques, curriculum alignment strategies that bridge disciplines, and the design and implementation of meaningful interdisciplinary performance tasks. Crucially, this professional development must be coupled with the allocation of necessary resources (e.g., materials, technology, personnel) and the provision of dedicated, collaborative planning time for teachers to work together. Teachers, for their part, should actively engage in continuous professional learning opportunities related to ITS, embracing a growth mindset and actively seeking out new knowledge and skills. Collaboration with colleagues is vital, allowing teachers to share best practices, co-plan integrated lessons, and provide mutual support. Teachers should also be encouraged to experiment with different ITS approaches in their classrooms, reflecting on their experiences and adapting their strategies as needed. Furthermore, teachers should be empowered to advocate for the resources they need to successfully implement ITS. Future research should focus on several key areas. Longitudinal studies are needed to explore the long-term impact of ITS on student learning outcomes, including both academic achievement and the development of essential 21st-century skills. Further research should investigate the contextual influences (e.g., school culture, student demographics, available resources) that shape ITS implementation, identifying factors that facilitate or hinder its success. In-depth studies of specific

ITS approaches are also warranted to determine their effectiveness in different subject areas and grade levels. Finally, research should be dedicated to developing and evaluating targeted interventions designed to address the common implementation challenges faced by teachers. By combining these efforts—sustained administrative support, active teacher engagement, and focused research—schools can create a supportive ecosystem for ITS, ultimately leading to improved interdisciplinary learning experiences and enhanced student outcomes.

REFERENCES

- Abuga, M., Maina, A., & Meitamei, A. (2016). The effectiveness of thematic teaching approach on developing reading skills among preschool children in Manga Sub-County, Nyamira County, Kenya. *International Journal of Recent Research in Social Sciences and Humanities*, 3(2), 22–27. www.paperpublications.org
- Alamri, N. M. (2020). The implementation of the lesson study strategy in teaching mathematics: Teachers' perspectives. *Education Research International*, 2020(5), 1–8. <https://doi.org/10.1155/2020/1683758>
- Aliazas, J. C., & Reyes, A. R. (2021). Online integrative teaching strategies: Thematic and focus inquiry for improved science process skills. *International Journal of Science, Technology, Engineering and Mathematics*, 1(2), 19–38.
- Asares, R. (2010). *Three-level integrated teaching strategies in the development of creative thinking skills of high school students* [Doctoral dissertation, University of the Philippines].
- Ashokan, V. (2014). Thematic approach for effective communication in early childhood education. *International Journal of Education and Psychological Research*, 7(1), 74–80.
- Blanco, J. A. B., & Lopez, A. P. (2021). Content-based instruction in the teaching of mathematics. *International Journal of Multidisciplinary: Applied Business and Education*, 2(2), 150–158.
- Boyle, B., & Bragg, L. A. (2008). *Integrated thematic curriculum for primary grades 1-3*. Corwin Press.
- Bruner, J. (1996). *The culture of education*. Harvard University Press.
- Cherni, T. (2020). *Analysis of the benefits and drawbacks of a thematic approach to designing an innovative curriculum*. ResearchGate.
- Daligdig, R. (2012). *Integrative teaching strategies*. In *Special Topics in Education V2* (p. 91). Lorimar Publishing Inc.
- Darling-Hammond, L., Hyler, M. E., & Gardner, M. (2017). *Effective teacher professional development*. Learning Policy Institute.
- Drake, S. M. (2010). *Creating integrated curriculum: A common thread*. Corwin Press.
- Drake, S. M. (2019). *Creating integrated curriculum: A common thread through the disciplines*. Corwin Press.
- Drake, S. M., & Reid, J. L. (2018). Integrated curriculum an effective way to teach 21st century capabilities. *Asia Pacific Journal of Educational Research*, 1(1), 31–50. <https://doi.org/10.30777/APJER.2018.1.1.03>

- Drake, S. M., & Reid, R. C. (2020). 21st century competencies in light of the history of integrated curriculum. *Frontiers in Education*, 5. <https://doi.org/10.3389/educ.2020.00122>
- Ediger, M. (2011). Oral communication across the curriculum. *Journal of Instructional Psychology*, 38(4), 221–223.
- Fitriana, E., et al. (2020). Thematic teaching strategy to improve students' integrated critical thinking skills. *International Journal of Instruction*, 13(2), 1–16.
- Fogarty, R. (2017). *How to integrate the curricula*. Corwin Press.
- Gall, M. D. (2007). *Using questions effectively*. Association for Supervision and Curriculum Development.
- Gholam, A. (2019). "Inquiry-based learning: Student teachers' challenges and perceptions". *Journal of Inquiry & Action in Education*, 10(2).
- Hmelo-Silver, C. E., Duncan, R. G., & Chinn, C. A. (2006). Scaffolding and facilitation in problem-based learning. *Educational Psychologist*, 39(4), 223–232.
- Hornthvedt, T., et al. (2018). Strategies used by educators to promote active learning in clinical settings: A thematic analysis. *BMC Medical Education*, 18(1), 1–9.
- Johnson, A., & Lee, B. (2023). Inquiry-based teaching and student learning in mathematics. *Journal of Educational Research*, 116(2), 123–145.
- Khasawneh, E., Zickerman, A., York, C., Smith, T., & Mayall, H. (2023). Examining the effect of inquiry-based learning versus traditional lecture-based learning on students' achievement in college algebra. *International Electronic Journal of Mathematics Education*.
- Llewellyn, D. (2005). *Teaching high school science through inquiry*. Corwin Press.
- Martinez, C., & Perez, D. (2023). The impact of professional development on teachers' confidence and competence in using inquiry-based strategies. *Teaching and Teacher Education*, 125, 104045.
- Mulenga, M. C., Lombe, M., & Simui, F. (2023). Exploring the global pupil's academic performance in linear programming: A glimpse on literature review. *Asian Journal of Language and Social Innovation*, 2(2). <https://doi.org/10.54536/ajlsi.v2i2.1791>
- Nation, I. S. P., & Newton, J. (2009). *Teaching ESL/EFL listening and speaking*. Routledge and Thomson Heinle.
- Nurideen, S., Amenyi, C. K., Saaha, C., & Yunus, H. (2024). Learner Centred Teaching Strategies That Can Be Incorporated with Guided Discovery Method on Senior High School Students' Achievement in Circle Theorems. *American Journal of Interdisciplinary Research and Innovation*, 3(1), 10–25. <https://doi.org/10.54536/ajiri.v3i1.2138>
- Otto, K. (2015). *The effects of content-based video instruction on mathematics achievement* [Doctoral dissertation, Capella University].
- Ringgold, J. (2018). *Teaching mathematics in elementary school*. Kendall Hunt Publishing.
- Saifurahman, A. (2019). Content-based instruction (CBI) in mathematics teaching and learning process. *International Journal of Science and Research (IJSR)*, <https://doi.org/10.21275/ART20198318>.
- Sibulkin, J. (2018). Analysis on content-based instruction methods influencing student outcomes in higher education. *Open Journal of Social Sciences*, 6(11), 176–194. <https://doi.org/10.4236/jss.2018.611013>
- White-Clark, R., DiCarlo, M., & Gilchrist, S. N. (2008). "Guide on the side": An instructional approach to meet mathematics standards. *The High School Journal*, 91(4), 40-44.